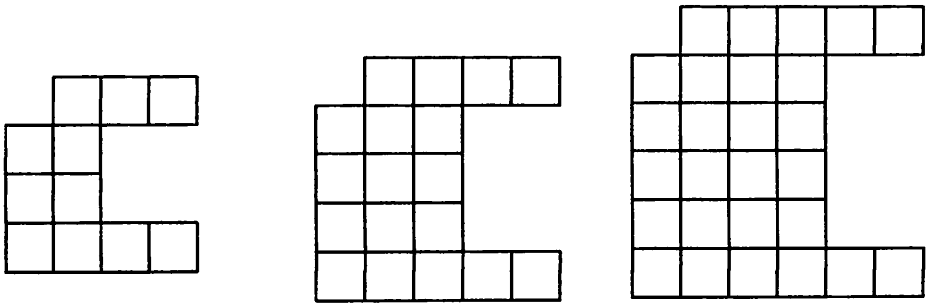
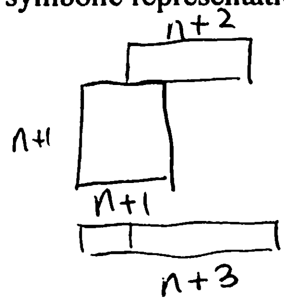
M^{2}P Post-Assessment **NAME:**____________________________

1. Pictured below are the first three terms in a sequence:

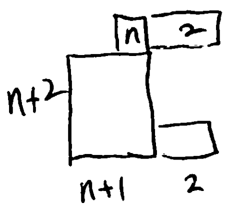


a. Find **two** distinct (but equivalent) expressions for the number of squares in the n^{th} term of the sequence. For each expression, clearly connect it to the visual representation of the pattern. How does the visual representation generate the symbolic representation?

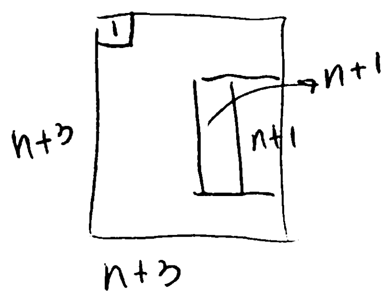
$(n+1)^2+(n+2)+(n+3)$



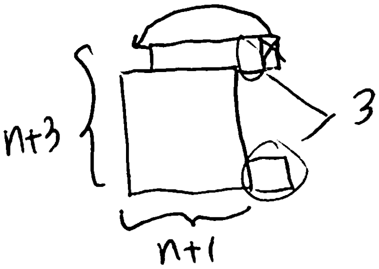
$(n+1)(n+2)+n+4$



$(n+3)^2-2(n+1)-1$

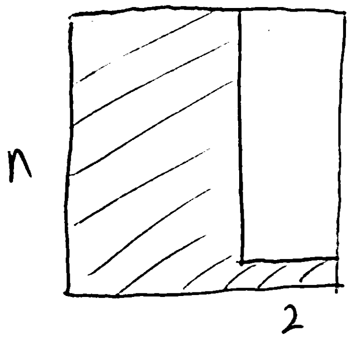


$(n+1)(n+3)+3$

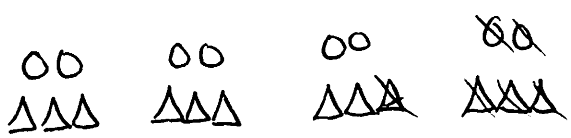


b. In which of the Standards for Mathematical Practices might students be most likely to engage on a task like this?

2. Sketch a visual representation of of a pattern for which the number of squares in the n^{th} term could be expressed as $n^2 - 2n + 2$. Indicate how your visual reflects the expression.



3. For the expression $4(2+3)-6$:
   a. Draw a visual representation of the expression. Clearly indicate how your visual represents the expression.

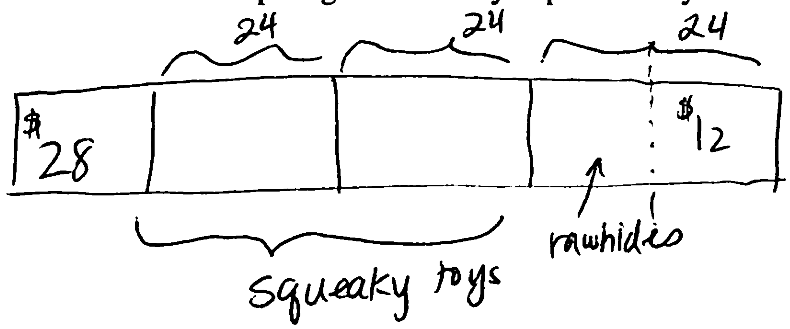


   b. Write a contextual situation that would be represented by the expression.

Leo makes 4 bags, each containing 2 oatmeal cookies and 3 peanut butter cookies, but Gus eats 6 of the cookies.

4. Gus spent \$28 of his allowance on dog biscuits, 2/3 of the rest on squeaky toys, and ½ of what was left after that for rawhides. He had \$12 left over. How much is Gus's allowance?

a. Solve with a strip diagram. Clearly explain how you are using the diagram to solve.



allowance = $28 + 3(24) = \$100$

First, \$28 is segmented from the strip, and then the remainder of the strip is split into 3 equal parts. Two of those parts are used for squeaky toys. Half of the last part represents what remains, \$12, so each of the 3 boxes is worth \$24.

b. Solve using equations. It should be clear what your equations represent.

Let a = Gus's allowance

$$\left(\tfrac{1}{3}(a-28)\right)\tfrac{1}{2} = 12$$

$$\tfrac{1}{6}(a-28) = 12$$

$$a-28 = 72$$

$$a = 72+28 = 100$$

$$(a-28) - \tfrac{2}{3}(a-28) - \tfrac{1}{2}\left(\tfrac{1}{3}(a-28)\right) = 12$$

$$\tfrac{1}{6}(a-28) = 12$$

$$\vdots$$

c. Write one or two sentences explaining in what ways your two solution methods are connected.

d. In which of the Standards for Mathematical Practices might students engage when solving this problem? Does the method they use impact the SMP? What is the impact of connecting the two strategies?

5. How might a student using number sense and a conceptual understanding of equality, rather than procedures, solve the equation $3(x+5) - 4 = 20$?

something $-4 = 20$, so that something must be 24

3 times something is 24, so that something must be 8

something $+5 = 8$, so that something must be $\underline{\underline{3}}$